

Appl. No. 10/735,041

Amdt. Dated May 10, 2006

Reply to Office Action of February 14, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the above-identified application:

Claim 1 (currently amended): An apparatus for measuring the current position of an object, comprising:

a magnetic sensor assembly having serially arranged therein, a magnetic field source, a magnetic field sensor, and at least first and second separated pole pieces forming a first air gap and a second air gap, respectively, therebetween, the first air gap located in parallel with the second air gap;

a platen coupled to the object and moving therewith and interacting with the magnetic sensor assembly, the platen containing (i) a first region having magnetic properties that vary monotonically within a predetermined number of radians of rotation of the platen and (ii) a second region of position varying magnetic properties, the platen configured such that the first region and second region move[[s]] through the first air gap and the second gap, respectively, in a first direction in response to movement of the object, the first region having magnetic properties that vary monotonically within a predetermined number of radians of rotation of the platen, thereby changing the magnetic reluctance of the first air gap and the second air gap, respectively, and the magnetic field measured by the sensor, wherein the measured magnetic field indicates the current object position.

Claims 2 and 3 (canceled).

Claim 4 (original): The apparatus of claim 1 wherein the position being measured is the angular position of the object and the platen rotates as a function of the angular position of the object, and the first region lies in a principal surface of the platen and is substantially circular in shape so that the position varying magnetic properties of the first region pass sequentially through the air gap as a function of rotation of the object.

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Claim 5 (canceled).

Claim 6 (currently amended): The apparatus of claim [[5]] 1 further comprising still further separated pole pieces forming a third air gap therebetween located in parallel with the first and second air gaps, and wherein the platen has a third region of position varying magnetic properties that passes through the third air gap in response to changes in the position of the object.

Claim 7 (currently amended): An apparatus for measuring the angular position of an object, comprising:

- a rotatable platen coupled to the object so that rotation of the object causes rotation of the platen;

- a first magnetic sensor assembly having serially arranged therein:

- a first magnetic field source;

- a first magnetic field sensor having a first output;

- first and second magnetic pole pieces forming a first air gap therebetween;

- a first track located on the platen and passing sequentially through the first air gap as the platen rotates, the first track having magnetic properties that vary monotonically within substantially 2π radians of rotation of the platen;

- a second magnetic sensor assembly having serially arranged therein:

- a second magnetic field source;

- a second magnetic field sensor having a second output;

- third and fourth magnetic pole pieces forming a second air gap

- therebetween;

- a second track located on the platen and passing sequentially through the second air gap as the platen rotates, the second track having magnetic properties that vary in a second manner as a function of the angular position of the platen; and

- wherein the first output of the first sensor varies as a function of the varying magnetic properties of the first track, thereby providing a measure of the angular position of the platen and the object, and

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wherein the second output of the second sensor varies as a function of the varying magnetic properties of the second track, thereby providing a further measure of the angular position of the platen and the object.

Claim 8 (canceled).

Claim 9 (currently amended): The apparatus of claim [[8]] 7 wherein the first and second magnetic sensor assemblies are spaced apart a predetermined distance around the platen.

Claim 10 (currently amended): The apparatus of claim [[8]] 7 wherein the second track has a portion whose magnetic properties vary monotonically over substantially less than 2π radians of rotation of the platen.

Claim 11 (original): The apparatus of claim 7 wherein the first track is formed of a magnetic material whose radial width varies as a function of the angular position of the platen.

Claim 12 (original): The apparatus of claim 7 wherein the first track is formed of a magnetic material whose thickness varies as a function of the angular position of the platen.

Claim 13 (original): The apparatus of claim 7 wherein the first track is formed of a magnetic material whose magnetic density varies as a function of the angular position of the platen.

Claims 14-19 (canceled).

Claim 20 (new): The apparatus of claim 1 wherein at least the first region is formed of a magnetic material whose radial width varies as a function of the angular position of the platen.

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Claim 21 (new): The apparatus of claim 1 wherein at least the first region is formed of a magnetic material whose thickness varies as a function of the angular position of the platen.